# 2016-17 North Carolina Avid Quail Hunter Survey

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Since 1984, the North Carolina Wildlife Resources Commission (NCWRC) has conducted an annual avid quail hunter survey to estimate long term avid quail hunting trends and to provide annual insight into avid quail hunting demographics. Volunteer quail hunters participate by recording and submitting their annual hunting activity throughout the season. Quail hunting activity is recorded by county and landownership type (e.g. private or game lands) within 8 management units within North Carolina (Fig. 1). Reported hunting trips typically consist of a single day per hunting party.

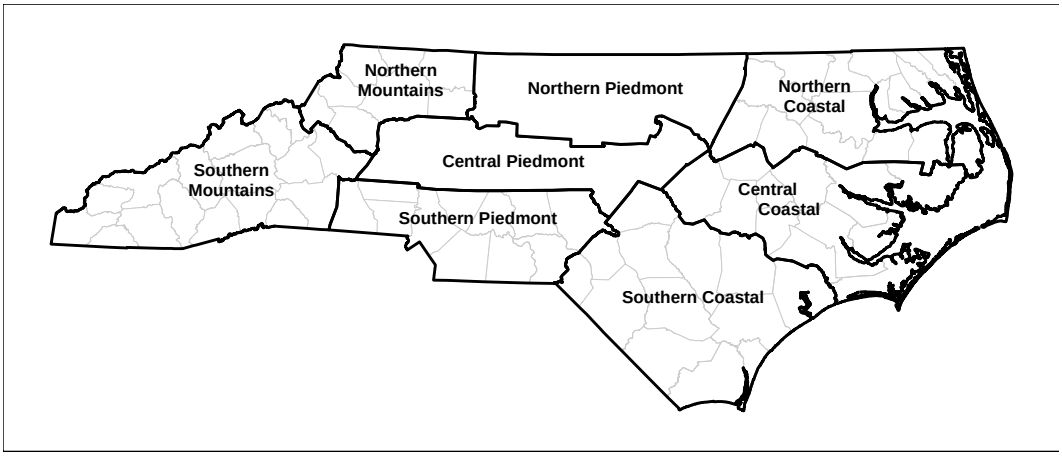


Figure 1. North Carolina quail management units in the avid quail hunter survey, 1984-85 through 2016-17.

Fifty-seven avid quail hunters responded during the 2016-17 season, providing quail hunting statistics for 689 hunting trips (Fig. 2). The gradual annual decline of total reported quail hunting trips has primarily been a function of fewer survey respondents and fewer hunting trips taken per hunter. This may also be a reflection of aging hunters, interest in other types of hunting, and/or declining opportunities to hunt quail due to lack of quality habitat and populations.

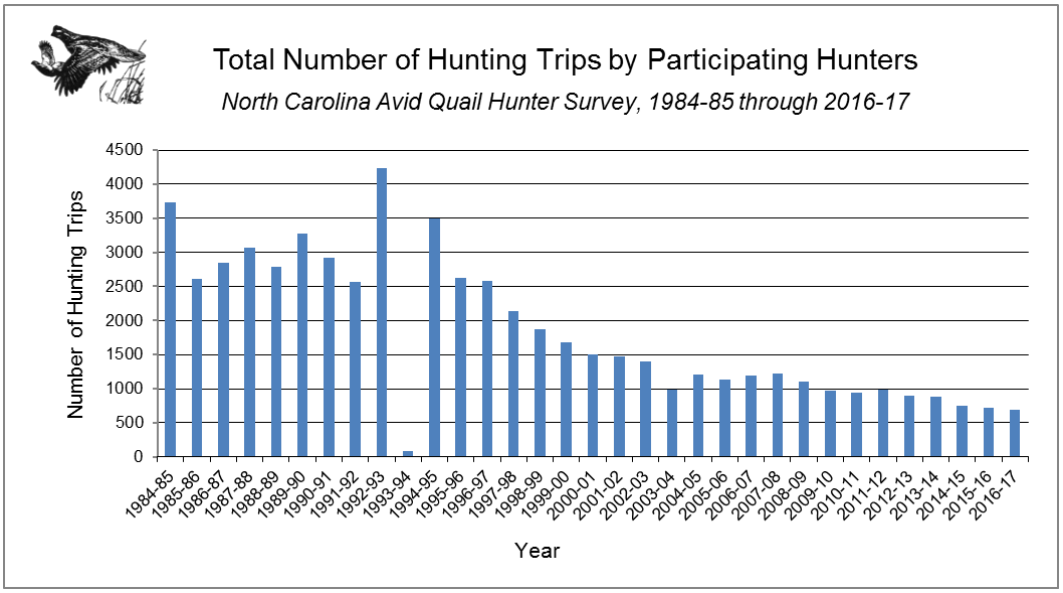

Figure 2. Total number of hunts reported by volunteer avid quail hunter survey respondents, 1984-85 through 2016-17.

During the 2015-16 hunting season, most reported avid quail hunting occurred in the coastal management units and the least in the mountain units (Fig. 3). This is not surprising given that quail are fairly common in the coastal plain, somewhat uncommon in the piedmont, and very rare in the mountains. Since 1984, the long term trend for the number of trips per hunter has continued to decline (Fig. 4) while the number of hours hunting per trip has generally fluctuated between 3.5 and 4.0 hours per hunt (Fig. 5). Avid quail hunters went afield an average of 12.1 trips and hunted 3.4 hours per trip during the 2016-17 season. Party size averaged 1.7 hunters per hunting trip. It is important to remember that these figures only reflect avid hunters' activities when they are hunting wild quail. These individuals likely spend considerable additional time training or field trialing dogs, hunting out of state, or hunting pen-reared birds.

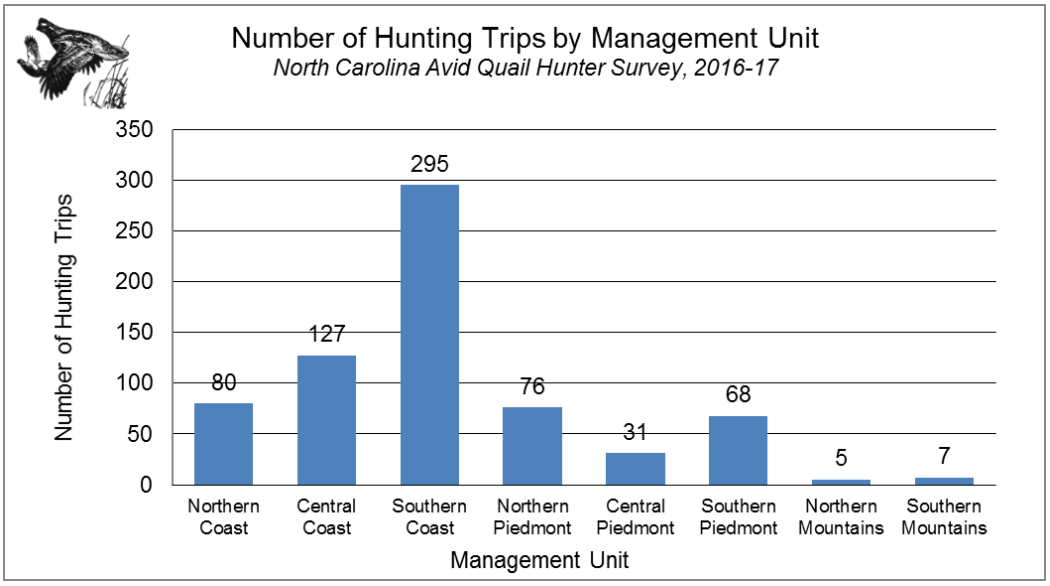


Figure 3. Total number of reported hunting trips by management unit by avid quail hunter survey respondents during the 2016-17 hunting season.

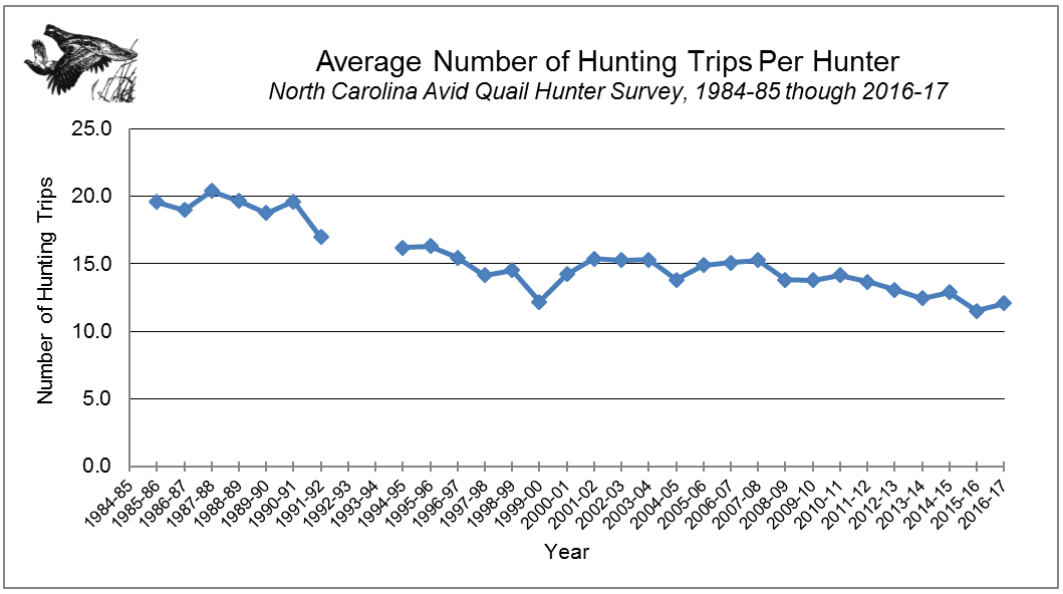


Figure 4. Average number of hunting trips per hunter in the avid quail hunter survey, 1984-85 through 2016-17.

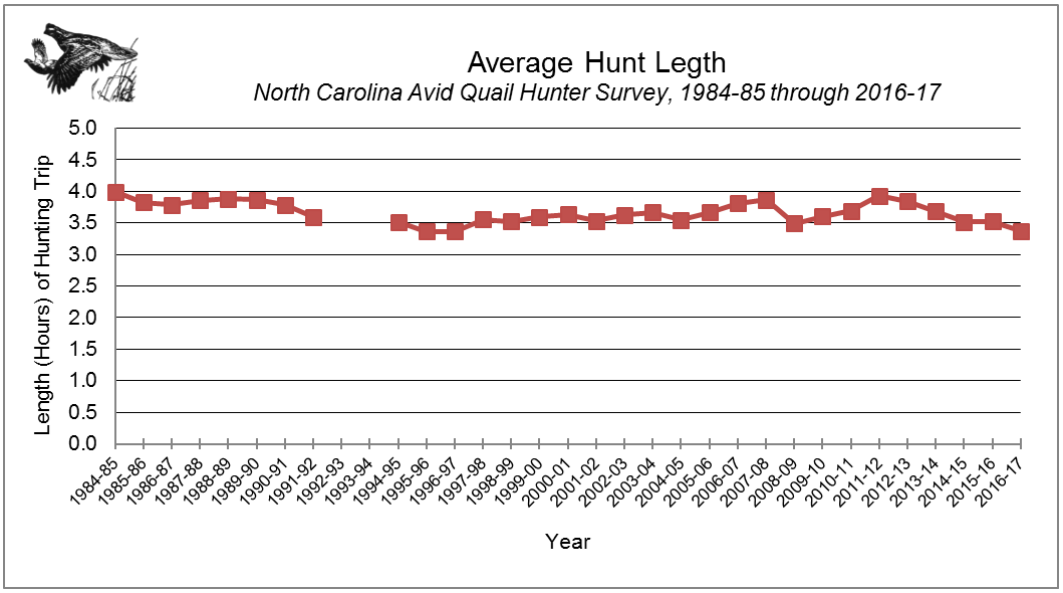

Figure 5. Average hunting hours per trip in the avid quail hunter survey, 1984-85 through 2016-17.

Covey flush rates are presented both by hunting trip and hours hunted. Flush rates by hour may provide more precise indices of quail abundance, while flush rates by hunting trip are more applicable from a quail hunting perspective. However, we recognize that hunters change their hunting locations over time to areas with relatively more quail. This selective behavior by avid hunters has a tendency to skew abundance trend estimates such that they may not represent actual annual abundances or changes in abundance across the full landscape.

More quail are typically found in the coastal management units than in the piedmont or mountain units (Fig. 6). In 2016-17, coastal flush rates (0.52 coveys/hour) continued to be higher than either the piedmont (0.33) or the mountains (0.11). The high degree of variability seen in the mountain region estimate in recent years is likely a function of a low number of reported hunts from the region, rather than actual changes in abundance. The low number of hunts reported from the piedmont and especially from the mountains is almost certainly a result of fewer areas of decent quail habitat and quail populations. Flush rates continue to be much higher on private land than on public game lands (Fig. 7).

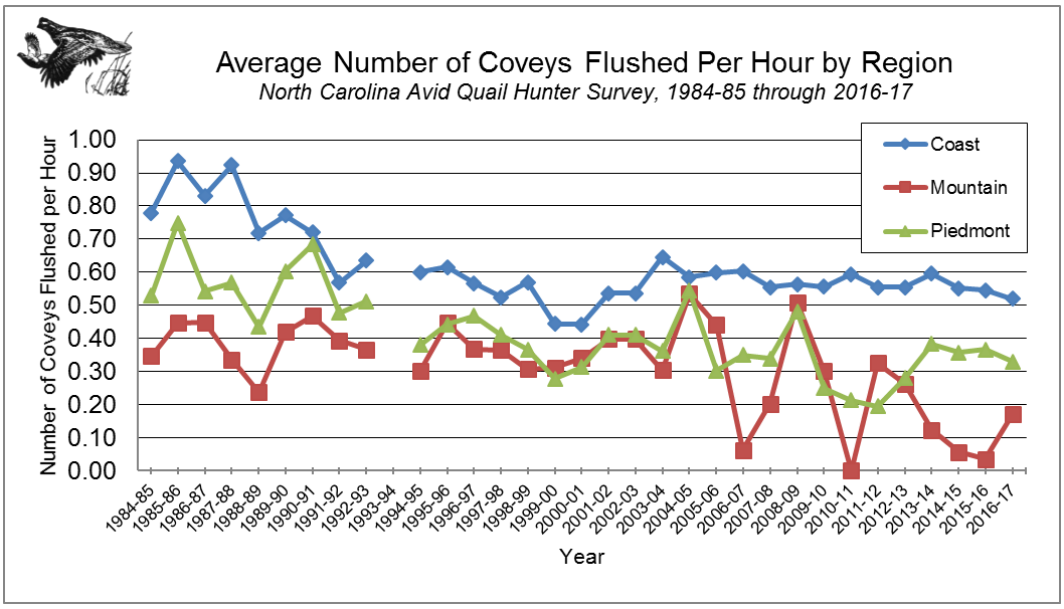


Figure 6. Average number of coveys flushed per hour by region by avid quail hunter survey respondents, 1984-85 through 2016-17.

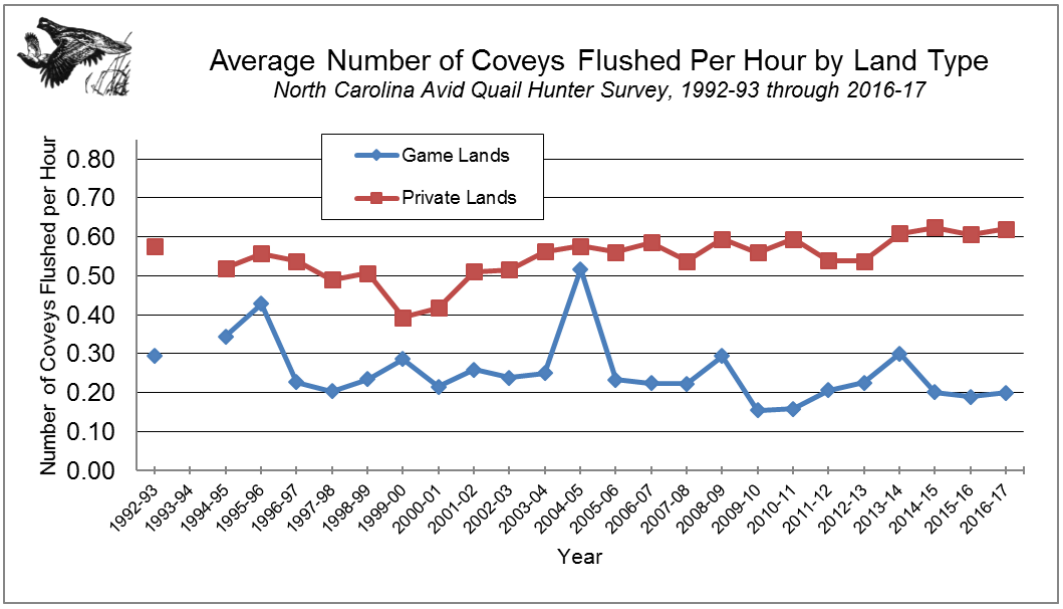


Figure 7. Average number of coveys flushed per hour by land type by avid quail hunter survey respondents, 1992-93 through 2016-17.

During the 2016-17 hunting season, avid hunters in the central coastal management unit reported the highest flush rates (3.05 coveys/trip) and harvest rates (3.03 quail/trip) (Fig. 9). The peak in this management unit was somewhat driven by a few survey participants that work year-round to ensure they have high-quality areas to hunt. Consequently, they experience high success rates. Most hunters are experiencing far lower success rates. Flush rates and harvest rates in the southern coast and piedmont are roughly comparable, suggesting that quail populations (where they are found) are roughly similar. However, the lower flush rates and harvest rates in the

mountains is likely due to quail being extremely scarce in these areas, with fewer quail to be found even where suitable habitat exists.

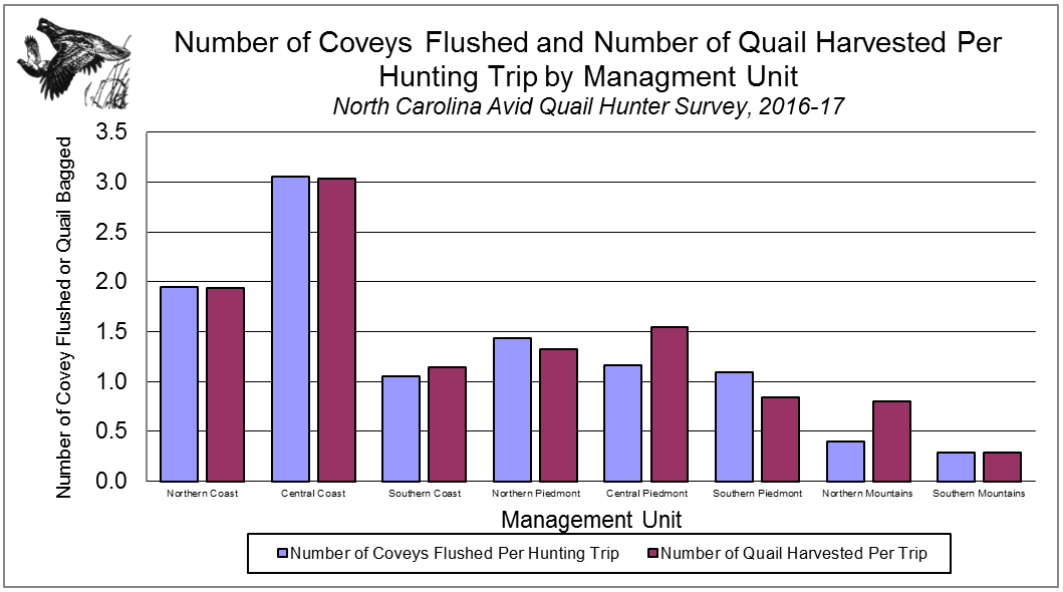


Figure 8. Average number of coveys flushed and quail harvested per hunting trip by management unit in the avid quail hunter survey, 2016-17 hunting season.

Despite the decline in avid quail hunters, the number of coveys flushed and quail bagged per hunting trip was relatively stable over most of the past 20 years (Fig. 9). However, these figures have declined somewhat in each of the last three seasons and it is unclear what they may do in the near and long-term future. During the 2016-17 season, avid hunters flushed on average 1.5 coveys and harvested 1.6 quail per hunting trip. Some avid hunters commented that they were likely to abandon quail hunting when quail were scarce. The stabilization of flush and harvest rates may indicate the minimum acceptable threshold for focused quail hunting to occur. "Avid" quail hunters continued to maintain higher harvest rates than "standard" quail hunters who have responded to the NCWRC statewide hunter surveys (<1 quail per hunting trip).

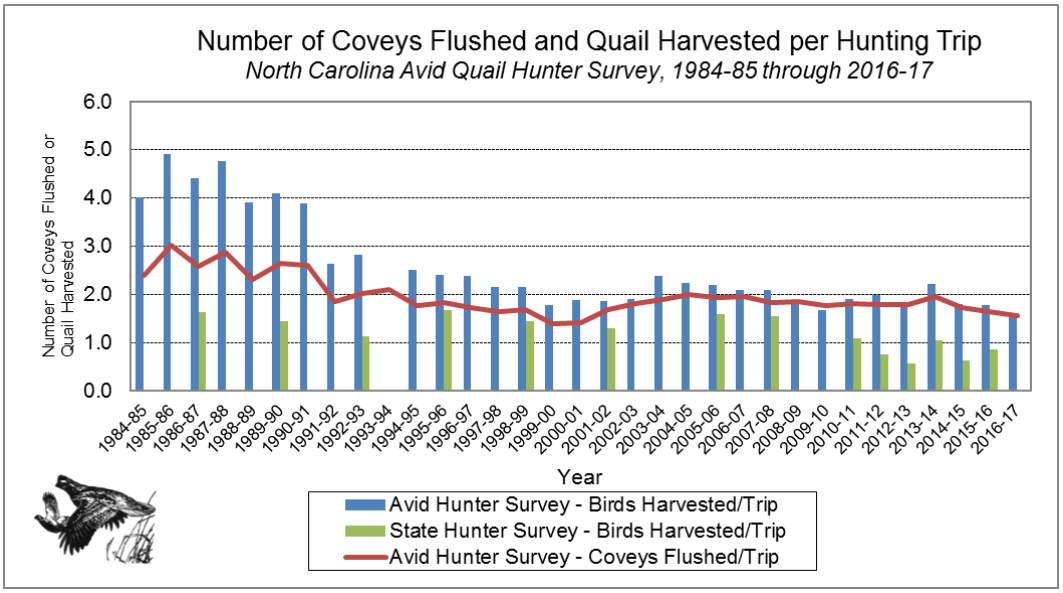


Figure 9. Average number of quail coveys flushed and birds harvested per hunting trip for avid quail hunter survey and state hunter survey respondents, 1984-85 through 2016-17.

From 1984 through 2009, the avid quail hunter survey has shown a general decline in the number of quail harvested from each covey flushed (Fig. 10). Since 2009, the number of quail harvested per covey has fluctuated between 1.0 and 1.2 quail/covey. This change may be related to more hunters choosing not to shoot flushed quail (because of their concern of quail declines) and/or their desire to primarily train bird dogs. Average reported covey size during 2016-17 was 11.4 quail. Reported covey size decreased steadily from 12.3 quail/covey in November to 10.1 quail/covey in February. Reported covey size was slightly higher on private lands (12.1 quail/covey) than on public game lands (9.5 quail/covey). No quail were flushed on 42% of the reported hunting trips.

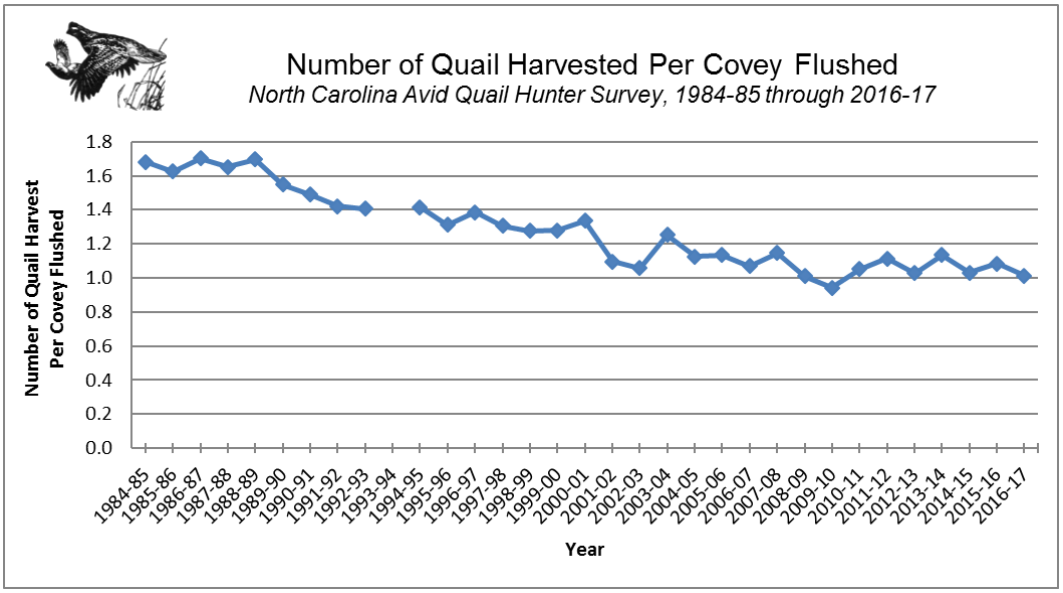


Figure 10. Average number of quail harvested per covey flushed by avid quail hunters, 1984-85 through 2016-17.

Reported quail hunting effort (number of trips) was highest during the month of December, which was somewhat unexpected as generally February has the most hunts reported (Fig. 11). Not surprisingly, avid hunters reported more covey flushes and harvests per trip at the beginning of the hunting season (Fig. 12). Additionally, these data reflect a general decline through the course of the season in both number of coveys flushed and number of quail harvested.

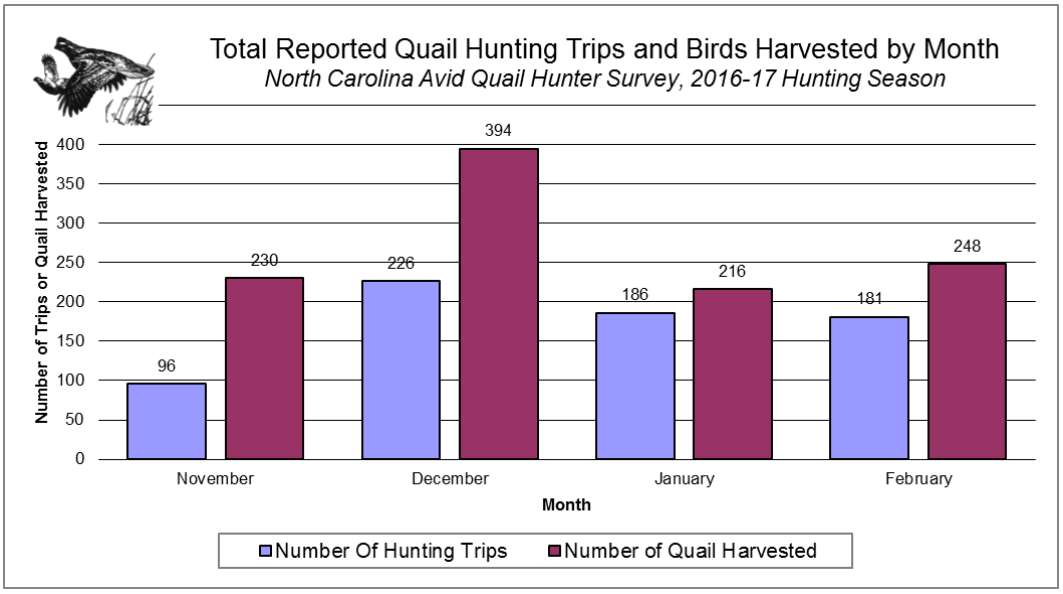


Figure 11. Total reported quail hunting trips and quail harvest by avid quail hunters during the 2016-17 hunting season (November 19, 2016 through February 28, 2017).

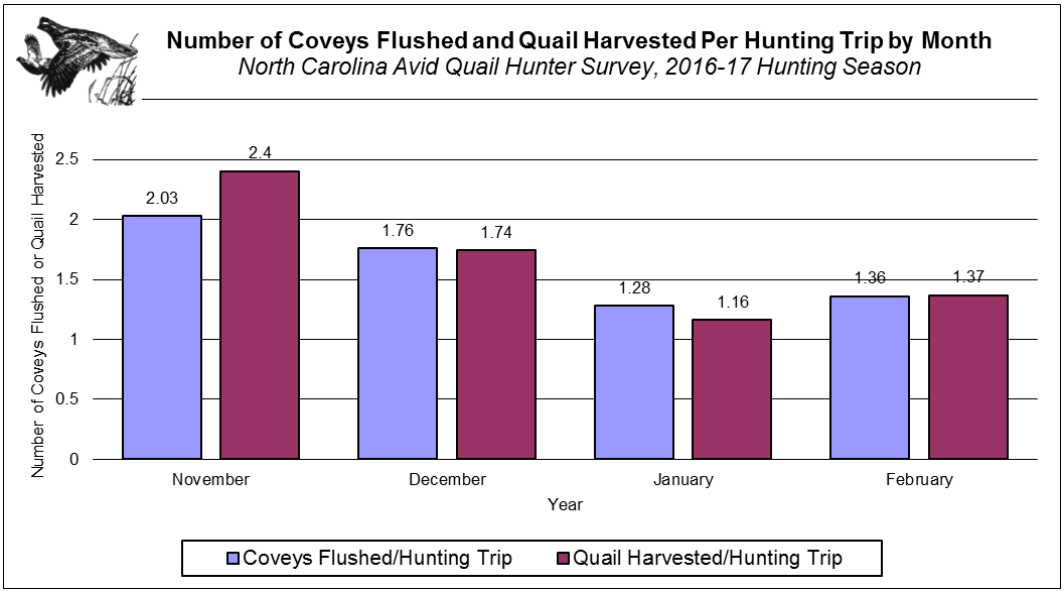


Figure 12. Average number of coveys flushed and quail harvested per hunting trip by month by avid quail hunters during the 2016-17 hunting season.

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*Funding for the avid quail hunter survey report was partially provided through a Pittman-Robertson Wildlife Restoration Multi-state Grant. The Federal Aid in Wildlife Restoration Act, popularly known as the Pittman-Robertson Act, was approved by Congress on September 2, 1937, and begin functioning July 1, 1938. The purpose of this Act was to provide funding for the selection, restoration, rehabilitation and improvement of wildlife habitat, wildlife management research, and the distribution of information produced by the projects. The Act was amended October 23, 1970, to include funding for hunter training programs and the development, operation and maintenance of public target ranges.*

*Funds are derived from an 11 percent Federal excise tax on sporting arms, ammunition, and archery equipment, and a 10 percent tax on handguns. These funds are collected from the manufacturers by the Department of the Treasury and are apportioned each year to the States and Territorial areas (except Puerto Rico) by the Department of the Interior on the basis of formulas set forth in the Act. Funds for hunter education and target ranges are derived from one-half of the tax on handguns and archery equipment.*

*Each state's apportionment is determined by a formula which considers the total area of the state and the number of licensed hunters in the state. The program is a cost-reimbursement program, where the state covers the full amount of an approved project then applies for reimbursement through Federal Aid for up to 75 percent of the project expenses. The state must provide at least 25 percent of the project costs from a non-federal source.*

**Appendix I. Reported hunting activity from avid quail hunter survey respondents, 1984-85 through 2016-17.**

| Year | # Avid Hunters | # Hunting Trips | Hours Hunted | Hours / Trip | Average Hunter Age | Trips / Hunter | # Coveys Flushed | Coveys Flushed / Trip | Coveys Flushed / Hour | Coveys Flushed / Hour - Game Land | Coveys Flushed / Hour - Private Land | # Quail Harvested | Quail Harvested / Trip | Quail Harvested / Hour | Quail Harvested / Covey Flush | # Hunts w/No Coveys Flushed | % Hunts w/No Coveys Flushed | Average Covey Size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1984-85 | | 3734 | 14,905 | 4.0 | | | 8,929 | 2.39 | 0.60 | | | 15,004 | 4.0 | 1.0 | 1.7 | 590 | 15.8% | |
| 1985-86 | 133 | 2605 | 9,963 | 3.8 | 47 | 19.6 | 7,867 | 3.02 | 0.79 | | | 12,785 | 4.9 | 1.3 | 1.6 | 237 | 9.1% | |
| 1986-87 | 150 | 2849 | 10,785 | 3.8 | 47 | 19.0 | 7,379 | 2.59 | 0.68 | | | 12,565 | 4.4 | 1.2 | 1.7 | 403 | 14.1% | |
| 1987-88 | 150 | 3062 | 11,802 | 3.9 | 47 | 20.4 | 8,819 | 2.88 | 0.75 | | | 14,574 | 4.8 | 1.2 | 1.7 | 373 | 12.2% | |
| 1988-89 | 142 | 2788 | 10,817 | 3.9 | 48 | 19.6 | 6,415 | 2.30 | 0.59 | | | 10,881 | 3.9 | 1.0 | 1.7 | 475 | 17.0% | |
| 1989-90 | 175 | 3282 | 12,677 | 3.9 | 48 | 18.8 | 8,697 | 2.65 | 0.69 | | | 13,455 | 4.1 | 1.1 | 1.5 | 369 | 11.2% | |
| 1990-91 | 149 | 2922 | 11,068 | 3.8 | 48 | 19.6 | 7,632 | 2.61 | 0.69 | | | 11,367 | 3.9 | 1.0 | 1.5 | 335 | 11.5% | |
| 1991-92 | 151 | 2562 | 9,213 | 3.6 | 49 | 17.0 | 4,747 | 1.85 | 0.52 | | | 6,750 | 2.6 | 0.7 | 1.4 | 559 | 21.8% | |
| 1992-93 | | 4241 | | | | | 8,524 | 2.01 | | 0.29 | 0.58 | 11,977 | 2.8 | | 1.4 | 765 | 18.0% | |
| 1993-94 | | 87 | | | | | 6,718 | 2.11 | | | | 0 | | | | 0 | | |
| 1994-95 | 216 | 3496 | 12,271 | 3.5 | 51 | 16.2 | 6,191 | 1.77 | 0.50 | 0.34 | 0.52 | 8,767 | 2.5 | 0.7 | 1.4 | 802 | 22.9% | |
| 1995-96 | 161 | 2628 | 8,832 | 3.4 | 52 | 16.3 | 4,809 | 1.83 | 0.54 | 0.43 | 0.56 | 6,308 | 2.4 | 0.7 | 1.3 | 584 | 22.2% | |
| 1996-97 | 167 | 2581 | 8,677 | 3.4 | 52 | 15.5 | 4,439 | 1.72 | 0.51 | 0.23 | 0.54 | 6,157 | 2.4 | 0.7 | 1.4 | 608 | 23.6% | |
| 1997-98 | 151 | 2142 | 7,618 | 3.6 | 53 | 14.2 | 3,531 | 1.65 | 0.46 | 0.20 | 0.49 | 4,611 | 2.2 | 0.6 | 1.3 | 548 | 25.6% | |
| 1998-99 | 129 | 1874 | 6,602 | 3.5 | 54 | 14.5 | 3,167 | 1.69 | 0.48 | 0.24 | 0.51 | 4,038 | 2.2 | 0.6 | 1.3 | 488 | 26.0% | |
| 1999-00 | 128 | 1678 | 6,036 | 3.6 | 55 | 12.2 | 2,168 | 1.39 | 0.36 | 0.29 | 0.39 | 2,772 | 1.8 | 0.5 | 1.3 | 538 | 34.5% | |
| 2000-01 | 106 | 1508 | 5,474 | 3.6 | 55 | 14.2 | 2,128 | 1.41 | 0.39 | 0.21 | 0.42 | 2,841 | 1.9 | 0.5 | 1.3 | 471 | 31.2% | |
| 2001-02 | 96 | 1478 | 5,212 | 3.5 | 56 | 15.4 | 2,498 | 1.69 | 0.48 | 0.26 | 0.51 | 2,738 | 1.9 | 0.5 | 1.1 | 390 | 26.4% | |
| 2002-03 | 92 | 1405 | 5,098 | 3.6 | 57 | 15.3 | 2,529 | 1.80 | 0.50 | 0.24 | 0.52 | 2,675 | 1.9 | 0.5 | 1.1 | 384 | 27.3% | |
| 2003-04 | 72 | 987 | 3,614 | 3.7 | 58 | 15.3 | 2,096 | 1.90 | 0.58 | 0.25 | 0.56 | 2,625 | 2.4 | 0.7 | 1.3 | 333 | 30.2% | |
| 2004-05 | 87 | 1201 | 4,255 | 3.5 | 56 | 13.8 | 2,388 | 1.99 | 0.56 | 0.52 | 0.58 | 2,691 | 2.2 | 0.6 | 1.1 | 344 | 28.6% | |
| 2005-06 | 76 | 1131 | 4,150 | 3.7 | 56 | 14.9 | 2,185 | 1.93 | 0.53 | 0.23 | 0.56 | 2,475 | 2.2 | 0.6 | 1.1 | 362 | 32.0% | |
| 2006-07 | 79 | 1192 | 4,543 | 3.8 | 57 | 15.1 | 2,336 | 1.96 | 0.51 | 0.22 | 0.59 | 2,495 | 2.1 | 0.5 | 1.1 | 363 | 30.5% | |
| 2007-08 | 81 | 1223 | 4,729 | 3.9 | 59 | 15.3 | 2,262 | 1.83 | 0.48 | 0.22 | 0.54 | 2,589 | 2.1 | 0.5 | 1.1 | 384 | 31.1% | |
| 2008-09 | 81 | 1100 | 3,841 | 3.5 | 58 | 13.8 | 2,083 | 1.86 | 0.54 | 0.29 | 0.59 | 2,105 | 1.9 | 0.5 | 1.0 | 339 | 30.3% | |
| 2009-10 | 71 | 978 | 3,521 | 3.6 | 61 | 13.8 | 1,731 | 1.77 | 0.49 | 0.15 | 0.56 | 1,633 | 1.7 | 0.5 | 0.9 | 332 | 33.9% | |
| 2010-11 | 67 | 947 | 3,493 | 3.7 | 60 | 14.1 | 1,716 | 1.81 | 0.49 | 0.16 | 0.60 | 1,802 | 1.9 | 0.5 | 1.1 | 324 | 34.2% | |
| 2011-12 | 72 | 985 | 3,872 | 3.9 | 57 | 13.7 | 1,753 | 1.78 | 0.45 | 0.21 | 0.54 | 1,950 | 2.0 | 0.5 | 1.1 | 384 | 39.0% | |
| 2012-13 | 69 | 903 | 3,468 | 3.8 | 58 | 13.1 | 1,610 | 1.78 | 0.46 | 0.23 | 0.54 | 1,655 | 1.8 | 0.5 | 1.0 | 310 | 34.3% | 10.6 |
| 2013-14 | 71 | 883 | 3,249 | 3.7 | 59 | 12.4 | 1,729 | 1.96 | 0.53 | 0.30 | 0.61 | 1,960 | 2.2 | 0.6 | 1.1 | 271 | 30.7% | 11.1 |
| 2014-15 | 58 | 752 | 2,642 | 3.5 | 58 | 12.9 | 1,303 | 1.73 | 0.49 | 0.20 | 0.63 | 1,345 | 1.8 | 0.5 | 1.0 | 314 | 41.8% | 15.6 |
| 2015-16 | 62 | 715 | 2,519 | 3.5 | 61 | 11.5 | 1,175 | 1.64 | 0.47 | 0.19 | 0.61 | 1,275 | 1.8 | 0.5 | 1.1 | 343 | 48.0% | 11.5 |
| 2016-17 | 57 | 689 | 2322 | 3.4 | 60 | 12.1 | 1077 | 1.56 | 0.46 | 0.21 | 0.63 | 1088 | 1.6 | 0.5 | 1.0 | 289 | 42.0% | 11.4 |